REMARKS

A. Status of the Claims

Claims 182-196 were pending at the time of the Action. Claims 182-196 stand rejected. The specific grounds for rejection and Applicants' response thereto are set forth below.

B. Rejections Under 35 U.S.C. §112, First Paragraph – Written Description

Claims 182-196 stand rejected for an asserted lack of adequate written description in the specification under 35 U.S.C. §112, first paragraph. In particular, the Action asserts that the specification does not describe all PAGs required to practice the method of claim 182 in a manner that satisfies either the *Lilly* or *Enzo* standards. For example, the Action states that the specification does not provide the complete structure of any PAG, does not disclose a "representative number" of species of PAGs, does not provide any physical or chemical characteristics of the PAGs, and does not provide any physical or chemical characteristics coupled with a known or disclosed correlation between structure and function. Applicants traverse this rejection as the claims are fully supported as described below.

1. The Specification Describes PAGs Supporting the Full Claim Scope

Contrary to the Action's assertion that the present specification does not provide the complete structure of ***any*** PAG (Action, p. 4), Applicants note that the specification discloses both cDNA and amino acid sequences of numerous bovine PAGs that are present early in pregnancy and are undetectable at about two months post-partum. For example, the specification provides sequence listings for the amino acid and nucleic acid sequences for BoPAGs 4, 6, 7, 16, 17, 20, and 21, each of which the Action acknowledges is a PAG that is present early in

pregnancy and is undetectable at about two months post-partum. *See e.g.*, Specification, p. 10, ln. 10 to p. 13, ln. 2.

Thus, the specification provides the complete structure of at least seven PAGs that the Action acknowledges fall within the scope of the claims. Accordingly, the Action's assertion that the present specification does not provide the complete structure of any PAG is without merit and cannot form the basis of the present rejection.

2. The PAGs Disclosed Are Representative of the Entire Claim Scope

In *Eli Lilly*, the court stated that "[a] description of a genus of cDNAs may be achieved by means of a recitation of ***a representative number*** of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to the members of the genus, which features constitute a substantial portion of the genus." 119 F.3d 1559, 1569 (Fed. Cir. 1997) (emphasis added). Applicants are ***not*** required to disclose ***every species*** encompassed by their claims even in an unpredictable art. *Id.* In contrast to this legal precedent, the Action appears to be applying a standard that requires recitation of the structural features of every species within the genus.

As discussed above, the specification provides the structure of ***seven*** PAGs that the Action acknowledges are present early in pregnancy and are undetectable at about two months post-partum. If the Action has a basis for asserting that this is not a representative number of species within the genus of bovine PAGs that are present early in pregnancy and are undetectable at about two months post-partum, then the Action should be able to explain what number would be. No such basis or number has been provided. The Action's vague reference to "structural diversities" among different PAGs fails to substantiate a rejection on the grounds that the present specification does not disclose "a representative number" of species under the *Eli Lilly* standard.

3. The Disclosure is Commensurate With the Claims

Per *Enzo*, the specification can show that the claimed invention is complete "by disclosure of sufficiently detailed, relevant identifying characteristics... *i.e.*, complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics." 296 F.3d 1316, 1324 (Fed. Cir. 2002). In other words, while structural formulas such as those of the PAGs provided in the specification provide a convenient method of demonstrating possession of specific molecules, other identifying characteristics or combinations may demonstrate the requisite possession. *See* MPEP § 2163(II)(A)(3)(a). Here, the present specification adequately describes detecting at least one pregnancy associated antigen (PAG) in the sample that is present early in pregnancy and is undetectable at about two months post-partum such that a person of ordinary skill in the art would understand that the inventors were in possession of the claimed invention at the time of filing.

First, and as discussed above, the specification provides the structure of seven PAGs that the Action acknowledges are within the scope of the claims. Furthermore, while there is some degree of structural diversity among PAGs, there is also a high level of conservation. As shown in FIG. 4, for example, there is ***substantial identity*** among bovine PAGs at both the nucleic acid and amino acid level. This conservation is further illustrated in the sequence alignments provided in FIG. 1 and the phylogenic tree provided in FIG. 5. The alignments show both conserved regions and indicate a common ancestry. It must further be noted that the genus of PAGs is limited because such PAGs are ***naturally produced*** by bovine animals. Specifically, the claims are directed to a method for detecting pregnancy in a bovine animal that involves detecting at least one of the aforementioned PAGs that is present in a biological sample from the

animal. This situation is vastly different from the case in which a nucleic acid or polypeptide sequence is claimed without sufficiently defining the corresponding structure. In that instance the number of sequences encompassed could be boundless. Here, the genus of sequences is limited by what PAGs are produced by a bovine animal, and these sequences have been shown to be related. The biology of the animal thus dictates a finite and limited class of PAGs. It must also be noted that the PAGs detected in the claimed method share ***both structural and functional*** characteristics. The claims require the shared functional characteristic of presence early in pregnancy and absence by about two months post-partum, which is significant in that early detection is needed given that artificial insemination is successful less than 50% of the time (see specification page 2, line 25 to page 3, line 4). The shared structural characteristics are demonstrated in the alignments given in FIGs. 1 and 4 and the tree presented in FIG. 5.

The present specification therefore discloses a representative number of bovine PAGs that are present early in pregnancy and are undetectable at about two months post-partum. The specification also teaches that, due to the homology among bovine PAGs, one can utilize nucleic acid probes or antibodies to known PAGs to screen placental tissues at various time point during pregnancy to isolate additional, novel PAGs that are present early in pregnancy and are undetectable at about two months post-partum. *See e.g.*, p. 41, ln. 25 to p. 42, ln. 2; p. 46, ln. 2-12; and p. 58, ln. 4 to p. 59, ln. 7. Thus, the present specification adequately describes the full scope of a method comprising detecting at least one bovine PAG in a sample that is present early in pregnancy and is undetectable at about two months post-partum under the relevant legal standards.

4. Conclusion

As explained above, Applicants have demonstrated that the present specification provides a full written description of the claimed subject matter in terms of the structure of representative PAGs within the scope of the claims. In addition, the present specification describes the relevant identifying characteristics of PAGs that are present early in pregnancy and are undetectable at about two months post-partum. Finally, it is shown, contrary to the assertions in the Action, that the genus of PAGs is not limitless and is in fact limited by the biology of bovine animals to a finite number of structurally related sequences. Applicants, therefore, respectfully request the withdrawal of this rejection.

C. Rejections Under 35 U.S.C. §112, First Paragraph – Enablement

Claims 182-196 stand rejected for lack of enablement. The Action acknowledges that the specification is enabling for PAGs 4, 6, 7, 16, 17, 20, and 21, but asserts that the specification is not reasonably enabling for all PAGs encompassed by the claims. Applicants respectfully traverse.

1. The Action Fails to Establish a *Prima Facie* Case of Non- Enablement

The test of enablement is whether the specification teaches a person of ordinary skill in the art how to make or use the invention without undue experimentation. MPEP § 2164.01. Whether making and using a claimed invention requires undue experimentation is not a single factual determination, but rather, it is a conclusion reached by weighing all of the *Wands* factors. MPEP §2164.01(a). It is improper to conclude that a disclosure is not enabling based on an analysis of only one of the *Wands* factors while ignoring the others. *Id.*

In support of the present rejection, however, the Action merely restates its arguments for lack of written description. Specifically, the Action states that the specification does not provide the complete structure of any PAG, does not disclose a "representative number" of species of PAGs, does not provide any physical or chemical characteristics of the PAGs, and does not provide any physical or chemical characteristics coupled with a known or disclosed correlation between structure and function. At best, the Action has considered one of the *Wands* factors. This is insufficient to establish a *prima facie* case for lack of enablement.

Still further, the Action itself acknowledges enablement for ***seven*** PAGs within the scope of the claims. No basis has been provided to conclude why these examples alone do not demonstrate enablement for the full scope of the claims. Enablement is satisfied as long as at least one method is provided for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claims. MPEP 2164.01(b) (citing *In re Fisher*, 427 F.2d 833, 839, 166 U.S.P.Q. 18, 24 (CCPA 1970)). An assertion that the disclosure is not commensurate with the scope of the claims must be supported by evidence or reasoning substantiating the doubts advanced. *In re Dinh-Nguyen*, 181 U.S.P.Q. 46 (CCPA 1974); *In re Wright*, 999 F.2d 1557, 1562 (Fed. Cir. 1993) (examiner must provide a reasonable explanation as to why the scope of protection provided by a claim is not adequately enabled by the disclosure). None of these requirements have been met and thus removal of the rejection is respectfully requested.

2. The Specification Provides an Enabling Disclosure

The present specification teaches a person of ordinary skill in the art how to make and use the invention without undue experimentation. First, the Action acknowledges that the specification is enabling for PAGs 4, 6, 7, 16, 17, 20, and 21. These examples alone demonstrate

enablement for the full scope of the claims. Furthermore, the present specification discloses both cDNA and amino acid sequences for these and other bovine PAGs. *See e.g.,* Specification, p. 10, ln. 4 to p. 13, ln. 2. While different PAGs may have different amino acid sequences, Applicants again point out that there is substantial identity among bovine PAGs at both the nucleic acid and amino acid level. *See e.g.*, FIG. 1 and FIG. 5. In fact, the inventors cloned the novel, bovine PAGs disclosed in the specification using nucleic acid probes from known bovine, ovine, and porcine PAG1 and PAG2, and equine PAG cDNAs. p. 59, ln. 24-26.

The present specification provides a detailed description of PAGs. *See e.g.,* page 18, line 27 to page 28, line 13. As appreciated by the inventors and explained in the specification, temporal expression during pregnancy can vary among PAGs. Certain PAGs, therefore, can be used for the detection of pregnancy at an early stage. *See e.g.,* Specification, p. 50, ln. 11-25. In addition to the specific PAGs disclosed in the specification, the specification fully describes the assays and procedures that would be used by one of skill in the art to isolate additional PAGs within the scope of the claims. *See e.g.,* p. 41, ln. 25 to p. 42, ln. 2; p. 46, ln. 2-12; and p. 58, ln. 4 to p. 59, ln. 7; *see also* 1st Declaration of Dr. Green; and 2nd Declaration of Dr. Green. "[A] considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed." *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). The identification of additional PAGs within the scope of the claims would require no more than routine screening, and the present specification provides ample guidance with respect to the direction of such screening by way of the working examples. While some PAGs such as BoPAG1 are not present early in pregnancy and undetectable at about two-months post-partum, these PAGs can be readily identified using routine screening as explained above according to the

techniques used in the working examples. Further, the presence of inoperative embodiments does not necessarily render a claim nonenabled. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1577 (Fed. Cir. 1984). Enablement has therefore been fully demonstrated.

3. Conclusion

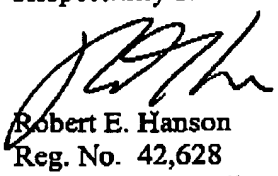
The present specification teaches a person of ordinary skill in the art how to make or use the invention without undue experimentation. The scope of enablement must only bear ***a reasonable correlation*** to the scope of the claims. MPEP § 2164.08. The Action fails to establish why the PAGs acknowledged to fall within the scope of the claims do not bear a reasonable correlation to the genus of PAGs that are present early in pregnancy and undetectable two-months post-partum. Second, the present specification provides a detailed description of PAGs and fully describes the assays and procedures that would be used by one of skill in the art to isolate additional PAGs that are present early in pregnancy and undetectable two-months post-partum. The Action thus fails to adequately doubt the truth or accuracy of these teachings and examples.

In view of the above, Applicants respectfully request the withdrawal of this rejection.

D. Conclusion

In light of the foregoing, applicants respectfully submit that all claims are in condition for allowance, and a notification to that effect is earnestly solicited. Should the Examiner have any questions regarding this response, a telephone call to the undersigned in invited.

Respectfully submitted,



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Date: September 1, 2005